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DESIGNING THE CITY AS A PLACE OR PRODUCT? HOW SPACE IS MARGINALISED IN THE SMART CITY

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INTRODUCTION

Smart urbanism is naturally concerned with the role that high technologies, and the shapers of these, play in the way cities are being developed or re-conceived. As Graham and Marvin noted in their seminal 1996 volume *Telecommunications and the City*, one of the potential major paradigmatic shifts of the emergence of the digital could be that proximity, and the role of physical space and distances, could be seen as an obsolete urban feature. This chapter's aim is to look at the role of physical urban space and design in 'smart' concepts and interventions. It discusses how the role of space seems to have radically shifted with the emergence of smart city visions. Despite in many ways being and having been a key component of what the 'city' is, and an essential agent in shaping it and addressing its problems, space is now marginalised within smart city visions as either being a main culprit and generator of problems, or a passive host of technological systems, simply needed for its physicality. The chapter briefly looks at examples of such approaches, and advocates for the need to re-frame smart civic design discourses and processes to include physical urban space as an agent and key component of urban development, rather than a platform for technology. Doing this, the chapter argues, calls for overcoming the idea of the smart city being a product of technology, and indeed articulated through the application of a series of technological products. It is our urban design knowledge and practice that needs to be at the same time updated and included.

THE UNEASY RELATIONSHIP BETWEEN DIGITAL URBANISM AND PHYSICAL SPACE

The relationship between visions inspired by – and inspiring – digital urbanism and the physical space dimension of the city has never been an easy one, often to the detriment and exclusion of the latter from being seen as key to transform urbanity. As the rise of cyberspace was being hailed in the early 1990s, the anti-spatial promise of the benefits of dematerialising functions (Negroponte, 1996) and of re-inventing more fluid forms of architecture and community by exploring virtuality (Novak, 1994; Jormakka, 2002; Beckmann, 1998; Rheingold, 1995) popularised visions based on the obsolescence or greatly diminished importance of physical space and its constraints. The history of the intersection of urban space and digital technology shows how this has been driven by deterministic, tech-first – or even tech-only – perspectives in which cyberspace was the change factor making the difference, whilst people and physical space were at the receiving end of it. Debates in the 1980s and 1990s were dominated by hyperbolic views of digital technology improving an otherwise decaying and disempowered world by making it more environmentally sustainable (see for instance Benedikt, 1991); boosting new forms of human association (Rheingold, 1995); pointing at new ways of settling (or re-settling) in economically and socially viable small towns whilst cities became obsolete (Toffler, 1990); and generally affirming new, prevalently virtualised, revolutionary economic and production models (Negroponte, 1996).

Despite the field having developed greatly ever since, this legacy is still very much skewing visions of urban change involving digital technologies. The proverbial danger of focusing on the finger pointing at the moon rather than admiring the moon itself can be a very real issue, and in 'smart city' visions the emphasis is very much on what 'smart' is and can do, leaving the city as simply the environment where this happens. As Mattern (2017) has noted referring to the 'Y-Combinator' approach to smart cities and civic 'effectiveness', 'There was hardly any mention of the urban designers, planners, and scholars who have been asking the big questions for centuries: How do cities function, and how can

they function better?'. In circles of smart city scholars and practitioners it is way too easy to concentrate on everything digital whilst overlooking what we already know about the city. This way, we can end up associating change, solutions and agency to the former whilst looking at space as simply the stage where new technologically induced lifestyles will unfold.

Linear, simplistic views of an all-dominating technology have been met of course with lively reflections and critique from various disciplinary perspectives. Yet, prevalent responses and continuous challenges to technological determinism have mainly engaged the socio-economic and political side of urban management and development, again leaving physical space in the background. Approaches looking at public participation and lack of social inclusion and justice within the digital/smart city have looked at the social dimension of augmented place-making, yet often taking for granted physical space as something already there, that did not need to be seen as a particularly active part of the equation. From early discourses of digital divides, inclusion and engagement (Schuler, 1996, for instance), social constructivist approaches to the shaping of urban civic networks (Aurigi, 2005), to more recent debates on smart citizenship (Foth et al, 2015; Hemment and Townsend, 2013) and community participation, to yet critique engaged with issues of socio-economic development, equality and justice (Hollands, 2008, 2015; Datta, 2015; Rekow, 2013), the possible roles of physical space and its potential agency through design and ability to affect relationships could have deserved more attention. This tension between digital and physical was also not helped by the prevalent, cautious view towards the impacts of cyberspace and digital interventions held by mainly architects and urban designers. Norberg-Schulz had issued his early warnings against the loss of meaning stemming from too mobile and fluid conceptions of inhabitation in the era of cybernetic thinking (Norberg-Schulz, 1971; 114). Reiwooldt advocated for architecture to be a refuge and help return to 'a real living environment separate from the insubstantial worlds of the computer' (Riewoldt, 1997; 10). Carmona et al (2003; 110) noted the challenges posed to public space – and the public realm – 'through the car and subsequently through the internet'. These were an understandable reaction to the often blind enthusiasm underpinning the rise of the digital, but facilitated a widening of the divide between those who were prevalently interested in technology and those who could have affirmed and helped include the agency of physical space and design within 'smart' perspectives. More recently, Picon (2015) has more explicitly looked at the smart city as a digital and physical construct, both discussing the relationships between smart urbanism and urban form (110-119), and the limits of "all-digital solutions" (146-148), but still with an overall view of 'smart' as infrastructure which gets added to the city.

The divide between scholars and practitioners focusing on the new, digital aspects of place and those warning of the related threats and the need to re-affirm the centrality of physical designs has therefore contributed to perceiving the two sides of the same coin as separate. So what role does urban space have in smart place-making and discourses? Two perspectives are worth highlighting.

SPACE IS THE PROBLEM: OVERCOMING THE CONTEXT WITH TECHNOLOGY

The widely deterministic and soft-utopian discourse coming from the corporate ICT sector (Söderström et al, 2014) and smart city entrepreneurs, implies somehow the need to declare current urban models as terminally ill. This is necessary to then assert the urgent need and fundamental inevitability of a series of high-tech solutions able to save the city from itself. Physical space and things are – within such discourse – the generators and cradle of a plethora of problems, rather than important variables to alter, design and re-design. In the perspective of mainstream, industrial smart city promotion, physical space is often part of the problem, and never part of the solution.

This can be seen as a further evolution of past technocratic approaches to declaring urban space in its present form as critically dysfunctional and in need of a radical re-organisation. For instance, modernist urbanism had challenged the poor life quality conditions of the early 20th century city arguing for a major re-thought of civic planning based on the new 'expert' knowledge of functional zoning (Dear, 1995). Architecture in the same period had advocated for the need to replace building practices with more industrialised and internationally de-contextualised and transferable ones, affording more universally healthy lifestyles overcoming the "old hostile framework" (Le Corbusier 1928, 307) offered by the city and its buildings.

The Modernists wanted to fix urban quality with a more 'expert' and mechanistic approach to spatial organisation and design, giving space agency though in very different terms and with very different emphases than previously. Grahame notes how "The city theory underlying the City as a Machine involves a simple, mechanistic calculus: four functions, repetition of specialized, standardized building typologies in special zoning enclaves" (Grahame, 2005: 48). The smart urbanism push takes this a – crucial – step further, by replacing a mechanical – hence physical – city with the idea of a digital one. 'Smart' firmly takes agency away from space and gives the ability to frame and fix the city to high technology. As Datta notes quoting a TEDx lecture given by Amitabh Kant in Delhi, the importance of digital, smart technology "means you can drive urbanisation through the back of your mobile phone" (quoted in Datta, 2015). The 'machine' is therefore no longer urban space or buildings. These alone have failed us – it could be argued – as the hosts and main generators of a series of emergencies. As Cowley and Caprotti (2019) have argued, the generic concept of the "Big Data driven 'control room'" sitting at the heart of the smart city's management structure can be seen on the one hand as a further evolution of positivist, modernist planning, but it also disrupts the latter offering a real-time, data based way of framing the city. And, it could be argued, an increasingly less 'spatial' one, at least as far as the agency of spatial intervention is concerned. Urban redemption now stems from sensing, data, and code.

But redemption is needed. Smart city hype and marketing tend to leverage on discourses of critical over-urbanisation, out-of-control densities and the consequent pressures on urban resources, the environment, citizen safety and management practices. These issues are widely discussed and accepted, as part of the UN's sustainable Development Goals. But whilst literature about these describes urban living as an opportunity and in a more balanced way focuses on needs such as tackling urban poverty and making sure physical built environment is affordable and of good quality (Sustainable Development Solutions Network, 2013), correspondent smart city rhetoric shifts this perspective and frames the physical city as terminally ill and in need of a major re-invention through digital technology. Articles and statements from the ICT corporate sector (for instance Menon, 2013; Living PlanIT, 2011; Schneider Electric) all have converged on implying that traditional ways of framing, understanding, managing and designing cities have become inadequate and unable to cope with the pace and scale of change, without the redeeming influence of high tech systems (Aurigi, 2016). This is a revival and commercial leveraging of the utopian hyperbole on the expected predominance of cyberspace over place, which had an acceleration at the dawn of the Internet in the early 1990s. The new visions of virtualised lifestyles, seen decades ago as literally replacing many decaying aspects of urbanity and indeed the need for cities itself (Toffler, 1990), are now expected to be the factor that will save an otherwise equally doomed city. Physical space per se might not be the object of replacement logics any longer, but its agency largely is.

SPACE IS THE PLATFORM: NEUTRAL STAGES FOR SOCIAL INTERACTIONS

Industry-dominated soft-utopian perspectives stem from a rather negative stance towards the role of pre-smart urban space, and place virtually all key change agency firmly with what ICTs can do mainly as a control and management infrastructure. However, approaches that are more sensitive to context, particularly social context, do exist. These stem from a less mechanistic and more critical view of the role of smart technologies with, and within, communities and place. But the role of urban space in these visions is often that of a neutral platform, or a passive 'host' for the digitally-based agency which is envisaged.

Much work both in terms of critique and practice has gone into considering how the development of digitally-enhanced places and of situated interactivity could be re-framed in ways that would make it more locally engaged, participated or based on alternative concepts to mainstream e-governmental, city management and place marketing approaches. This work ranges widely. One aspect is the reflection on the non-neutral, contested nature of urban analysis systems and dashboards (Kitchin et al, 2015) and the critical analysis and facilitation of various forms of grassroots or public-private action involving the production of locally relevant smart initiatives and the networking of these (Townsend, 2013). Another is the conception of non-profit systems and digital situated urban gaming associated with the 'Hackable City' concept (de Lange and de Waal, 2018) and cognate art installations. Some of the central tenets of these approaches include provoking and encouraging various degrees of community involvement and participation underpinned by a much-needed public space-based, inclusive, interactive and critical dimension to city smartness. Opportunities offered by the hybridity of space and place have been explored in pan-European research networks like *Cyberparks* (Smaniotto Costa et al, 2019) as well as a variety of initiatives of public interaction design across the globe. Other notable examples are for instance some of the projects associated with the work of the *Media Architecture Institute* (<http://www.mediaarchitecture.org/>) or the *Urban Informatics* research group (<https://research.qut.edu.au/designlab/groups/urban-informatics/>), as well as international networks and festivals fostering and showcasing urban interactive installations, such as Bristol-originated *The Playable City*.

This diverse landscape of projects is therefore much more place-conscious and related, and most approaches share an ethos focused on being 'located' and socially-participated. Agency is seen as not simply embedded within the technological component of a smart intervention, but above all placed within the community, which needs to be able to interact/play with, and even alter if necessary the technological system itself in some instances. It can be argued, however, that even in these more socially oriented cases there remain two potential weaknesses. The first is a degree of self-referentiality, particularly in cases of small-scale or temporary installations. The initiative makers and their colleagues may also end up being the main users, commentators and evaluators, obviously reinforcing a circular logic in reading and interpreting the projects exactly as the creators intended, and confirming their validity. De Lange's set of interviews with Playable City actors in Bristol (2015) highlights the positive shifts from a tech-centric to a people-centric view of the smart city, but also seem to reveal a degree of self-containment, where a relatively close and specialised artist community seems to measure the value and impact of installations through their personal/participant reactions, strong of a direct and implicit understanding and appreciation of the projects' language and intentions.

The second point to reflect upon is a prevalent focus on the project per se, on its technical or interactive character, rather than on the initiative as being conceived, analysed and strictly evaluated as part of any wider place-making strategy. Čakovská et al (2019) for instance reflect on how to approach the shaping and improving of 'blended space' stemming from a series of urban

design-related references aimed at highlighting the centrality of people's activities, interactions and participation levels in public spaces. Whilst this is certainly relevant and desirable, the focus ends up being on how ICTs can be added to space, with the latter seen as adequate "physical infrastructure" in which public spaces "have to provide resources for proper functioning of gadgets" (258). The practical methodological approach to achieve these aims shifts to an Interaction Design-led one.

Adding people and their interactions within civic design to the otherwise purely technocratic smart vision is indeed important. But if spatial design is left out as a gregarious – and most of the times already fixed – component, the shaping of urban digital projects can perhaps inadvertently sum up into the conception of a series of add-on devices or systems. Much of such practice of digitally augmenting place is dominated by projects that are virtual, temporary and/or mobile installations or applications, conceived very much as products able to be seamlessly transferred to or replicated in very different locations with minimal or no change. In a rare and precious effort at systematically tackling reflections and guidelines for the design of urban hybridity, Tomitsch (2018) generally sees 'city apps' as artefacts that need to "complement the built environment" which subtly suggest an add-on logic informing smart urban design (126-127).

Interaction design and urban media-based approaches have therefore the very significant merit of framing smart initiatives within a socially involved and contextualised approach, as well as looking at locating projects in real places with a potentially hyper-local dimension. However, it can be argued that whilst the social and the technological spheres are central to these, the spatial dimension remains in a supporting role. Pertinent considerations about the role that 'platforms' play in technologically advanced societies, and the need to carefully design and regulate these (Van Dijck et al, 2018) are informing much of the debate on social and urban digital media critique and production. The danger however is that such paradigm – the 'platform' – could easily extend to characterise a relatively infrastructural and passive role of urban space, seen as a recipient of initiatives rather than a generator and modifier of relationships itself.

To exemplify this we can look at a relatively early yet very well-articulated digital augmentation project of a public space, the Sonic Arboretum in Montreal. This scheme, conceived in the mid 2000s, aimed at augmenting the character and functions of a public small park – the Emile Gameline square in Montreal. A parallel digital environment, accessible both remotely under a 3D/VR modality, as well as at the physical square itself through located devices, augmented the park's physical features – trees and other structures – with digital exchange and interpersonal communication functionalities, and a focus on music files sharing. This meant that users of the system could 'meet' and communicate either by physically being present in the park or accessing it through its virtual 'mirror' on the internet. Despite such project would indeed manage to interestingly articulate the digital and the physical in potentially synergic re-combinations – the virtual, exchange trees were conceived to match the real ones in the park and afford these to become music information repositories – the focus and design effort was described as:

"the strategy of situating mobile communication activity within the larger framework of urban spaces as ecosystems, in which wireless networks would be more 'holistically' incorporated into the environment. This approach allows us to contextualize the flow of information within an expansive stream of other interactions the flow of people, traffic, food, resources, energy, weather, and ideas" (CHS UR OWN URBNSM blog 2007)

It can be argued that physical space was therefore still subordinate and playing a background, support role. The project's central aim was not understanding, conceiving and re-designing the park as a whole, but more about using the park as a rich physical platform for digitally-based interactions.

The same initiative could have been exported and replicated potentially anywhere else offering some open space, maybe including pathways and trees, or indeed some other physical elements – lamp posts, rails or even rubbish bins – that could be associated with the idea of hanging/leaving music ‘objects’ there.

Similarly, the already mentioned and well-known Playable City initiative and network, an idea originated in Bristol with increasing transferable, global extensions, aims to put “people and play at the heart of the future city, re-using city infrastructure and re-appropriating smart city technologies to create connections – person to person, person to city” (Playable City Vision). This is an interesting and attractive statement, putting an emphasis on some important, social aspects of place-making, yet again fundamentally treating physical space as the ‘city infrastructure’ that can act as a platform or stage for the interactive play facilitating connections. Playable City installations can certainly be provocative, evocative and useful to encourage interaction and increase the range and frequency of use of specific public spaces, but it is debatable whether they really start from place and have a close dialogue with it.

SIDEWALK TORONTO: HIGH TECHNOLOGY AS A CIVIC-SHAPING PARADIGM

In the two approaches to smart place-making considered so far the role of civic space shifts from holding a negative connotation as one of the main roots of urban problems, to a somehow neutral one, as the all-needed yet relatively passive context. In a way, these two perspectives about space as something to be overcome by technology or able to accommodate and support it, seem to play against each other, and advocates of the latter approach are very often major critics of the former, particularly on the grounds of the need to encourage community involvement. Yet, in both visions spatial design and agency is marginal at best, leaving technology – and technologists – as the central city-making actor.

The much-debated example of the Sidewalk Toronto prospected regeneration development can be used to briefly reflect on how in a relatively up-scaled and certainly very high-profile smart urbanism scheme, spatial design is present yet extremely marginal in terms of its influence as a change agent. It is well beyond the scope of this chapter to provide a detailed or comprehensive description of Sidewalk Toronto, its genesis and the full range of discussions around it. Much of the critique of the Alphabet/Google proposed urban development has been centred around the many issues that a techno-centric, privately-enacted and controlled regeneration scheme can raise in terms of the commodification of smart place and the data it generates. Some have noted how the project is posing itself as an operation of “privatised planning” (Valverde, 2018) allowing Sidewalk to circumvent an otherwise required degree of democratic accountability on its physical interventions and the way public consultations have been carried out (Bliss, 2019; Wylie, 2018a, 2018b; Valverde and Flynn, 2018). Above all much debate has unfolded on the ownership and use of algorithms and data, and the clear potential for non-transparent forms of surveillance (Wylie, 2017, 2019; Scassa, 2019; Canon, 2018).

However, it is important here to reflect on how the scheme has approached the relationship between civic space and smart technologies. Some focus is needed on the way debates and commentaries on Sidewalk Toronto seem to highlight how the initiative is informed by a combination of the two approaches towards smart city-making and urban space outlined so far in the chapter.

The city as obsolete: replacing the model

The problematisation and inadequacy of urban space and current civic models seems to have strongly characterised the rationale underpinning Sidewalk. Matti Siemiatycki, an associate professor at the University of Toronto's department of Geography and Planning, quoted in an article by Josh McConnell (2017) claims that "we aren't just building the city of yesterday, we are really trying to understand how to build the city of tomorrow" somehow characterising current urbanity as obsolete. The same article quotes Dan Doctoroff, CEO of Sidewalk Labs LLC, associating this with a "combination of technologies that are uniquely becoming available at this time, this moment right now, that are capable of addressing some of those big urban challenges" clearly transferring urban design agency, and a 'solution' status, to ICTs. Mattern (2017) also refers to Doctoroff's vision of a "revolution" enacted by starting "from scratch in the internet era" and building the city "from the internet up". Canon (2018) refers to a 2016 Google TechTalk video where "Anand Babu of Sidewalk Labs spoke about 'reimagining the city as a digital platform' and using tech to solve the problems big cities face". Valverde (2018) quotes urban affairs expert John Lorinc defining the project as a "built-form version of Facebook". It is therefore quite explicit that Sidewalk's approach is an anti-urban one informed by a vision where civic space and its current organisation and models seem unable to offer convincing answers to a multitude of contemporary challenges. A radical re-framing and total re-thinking of what a city should be like is then needed, and this has its paradigm in the digital machine one. This is a modular, platform-based machine. Urban space as we know it is also there to become a platform supporting this.

City as a platform: urban design by services and buildings as modular add-ons

One of the main tenets of Sidewalk's vision and approach, is some generic but powerful advocacy of the importance of flexibility and changeability of the city. Doctoroff has explicitly referred as a major inspiration to Walt Disney's original plan for the experimental EPCOT community in Florida as the blueprint for an ever-evolving city, "a platform that people create on top of" (McConnell 2017). Whilst the importance of seeing cities as incomplete systems that cannot be 'closed' or fully controlled in any way is an important reflection in contemporary urbanism (see for instance Sassen, 2017), this smart scheme uses the concept to assign this change agency, the ability to constantly transform the city, to ICTs and their users. This, and the need to rebuild 'from scratch', suggest a plug-in model where modular elements – physical, as well as the prevalent digital ones – populate a place which poses itself as a neutral stage. The urban design of Sidewalk Toronto appears to be a tabula rasa operation, where a context which is basically seen as a wasteland is over-imposed with a new technocratic vision. This vision is populated with constant references to add-on elements, automation and modularity or, in other words, with an urbanism based on the design of products, not place. These include a Carlo Ratti Associati-designed prototype for a 'dynamic street' modular intelligent paving (Walsh 2018), heated pavements and cycle lanes, solar power, energy and waste management systems, and underground tunnels and delivery/service robots (Wilson, 2019; Woyke, 2018; Won, 2018; Lam, 2019), and of course autonomous vehicles.

Choices regarding the buildings themselves, and their relationship with the contiguous public space, are also coherent with the industrial design, highly flexible, modular and plug-in character of the Sidewalk scheme. A contextual concession is made to Canada's economy and local resources through the choice of constructing a series of tower buildings, designed by Snøhetta and Heatherwick Studio, in structural timber. But the whole narrative around these seems to focus on a 'digital configurator', computer-aided system to employ a modular kit of parts (Baldwin 2019; Lam, 2019). The semi-public lower storeys of the buildings, and presumably their outdoor projection onto public space, are dedicated to "a porous, flexible program we call Stoa that is accessible to everyone", said the team. The Stoa would function as year-round spaces wrapped in transparent and

movable facades” (Baldwin, 2018), further reinforcing the open, modular but also fairly non-committal, ‘blank canvas’ vision of a fundamentally neutral and passive built environment offering a generic stage for technological or social plug-ins without taking a stance, or exercising any specific agency.

All of this leads to a specific place, in a specific and complex city, to be treated with an approach that seems to mainly articulate around product design and IT-based projects, which after all are paradigms that the ICT industry is most conversant with. The overall trajectory seems to be stemming not from what the docks area needs, but from borrowing a potentially attractive platform so that a generic technocratic experiment can be run on and through it. The neighbourhood seems to suffer from being dealt with in isolation, as a self-contained, close system with Sidewalk Labs recently lamenting the absence of light rail public transport able to connect the area and the rest of the city (The Canadian Press, 2019). Little or no reference to actual context is made in most of the available commentaries or interviews, both spatially and socially. The scheme feels like a *tabula rasa* intervention, relatively independent from the rest of the city, and carrying the potential for becoming the socially homogenous equivalent of a gated community as “Quayside’s current plans promise housing for people of all income levels. But the only company so far committed to moving there is Google Canada, suggesting an influx of young, affluent workers” (Austen, 2017).

TOWARDS A HOLISTIC VIEW OF AUGMENTED PLACE

The examples briefly considered so far seem to suggest that jettisoning or anyway marginalising considerations and approaches that value the role of urban space, rejecting spatial design and planning knowledge as somehow obsolete or impotent to make a difference, might have to be re-thought. A more holistic approach could be needed. One able to positively frame smart urban design as something articulating a combination of people, technology and indeed physical space as equally important and inter-connected actants in the making of place.

The importance of looking at digital technology as part of a multi-layered urban place, and the need to imagine and design this as a whole, has of course has been discussed before. Mitchell’s trilogy of books on the topic (1995; 1999; 2003) is a seminal contribution, together with work by McCullough (2005; 2013) and Shepard (2011). Following William Mitchell’s concept of “recombinant architecture” (1995, 47-105) and trying to expand that perspective with a more operational framework, Thomas Horan (2000) stressed the need to look at a whole place design perspective, rather than at digital add-on solutions.

“At one end of the digital place continuum are ‘unplugged’ designs that manifest little or no digital technology in their appearance and construction. Toward the middle of the continuum are various ‘adaptive’ designs, representing modest attempts to visibly incorporate electronic features into physical spaces. Occupying the far end of the spectrum are ‘transformative’ designs: rooms, buildings, or communities composed of truly interfaced physical and electronic spaces” (Horan 2000, 7)

Horan’s language could still be seen as being affected by a residual dualism – as he talks of physical and electronic spaces as potentially separate layers to be combined. But pervasive computing and the so-called Internet of Things were very much in their infancy then, and so were spaces and objects that could be seen at the same time and in themselves both physical and digital. The concept of ‘transformative design’ was nevertheless powerful in pointing at the fact that successful place-making in the internet era called for a vision where physical space, digital technology, and people (themselves conducting re-combined physical/digital lifestyles) were all contributing to and being

active dimensions of any design, and that designers needed to deeply consider their inter-dependencies.

And when projects accept the complex challenges that come from exploring extended, re-imagined ways of using public space and defining useful everyday typologies, rather than being add-on digital art or interaction, physical space becomes part of the equation again. An interesting experience and commentary came from the 'Breakout' project aiming at bringing knowledge work into public spaces (Townsend et al 2011). The research team could observe how the issues of digital living (and working in the specific case) actually combined with those of physical space organisation and design, and greatly depended on contextual factors. The trajectory could not just stick to a deterministic view of high technology impacting and changing the otherwise static platform of space. The other way around was equally true: space actively participated in the equation, affected the 'digital' and ultimately the two could not be de-coupled in trying to fulfil the design programme. Breakout suggests that when physical space is taken into account through a perspective on inhabitation, engagement with the everyday and (relative) persistence rather than a simply performative 'installation' mode, this calls for design considerations involving the role of space. This includes looking at private/public thresholds; how different activities help or hamper each other; presence of shelter and seating; filtering with building space and so on. The physical component of place becomes again a very active actor/participant, and sometimes a rather difficult one to deal with, rather than an allegedly docile and passive 'host'. In other words, and however obvious this might sound, if we intend to design successful augmented places, we need to keep interrogating and articulating all aspects of 'place', their relationships and affordances, and in doing this employ all knowledge we have on spatial and urban design, in a holistic way.

SHAPING AUGMENTED PLACES

What can this mean in practice? How can the process of designing augmented place be enriched? This chapter has argued so far that, whilst attention is being put on the need for more bottom-up social participation in the shaping of smart landscapes, much less thought has been going into re-introducing urban and architectural design principles and knowledge in order to let physical space – and actions involving it – participate themselves as actants.

At the start of the 1990s, in an article on remote communication titled *Being There*, David Brittan mentioned as an example a conversation with Chris Turner, from Olivetti Research Laboratories in Cambridge: "Do you need to see a video image of someone just to be asked out for a beer? 'Well, you don't - Turner admits - but don't you think is rather criminal that you can't?' In his view, the advent of two-way video on computer workstations is a matter of manifest destiny" (Brittan, 1992; 43-44). This is what we need to move away from: the attitude of deploying technological 'answers' just because we can, or we want to, where there are no clear or well-justified place-based questions to address after all. Marteen Hajer, chief curator of the 2016 Rotterdam International Architecture Biennale, questioned whether "If smart technology is the solution, then what was the problem again? It's almost like a solution looking for a problem" (quoted in Frearson, 2016). A good starting point therefore is to move away from a solution – and product – based approach back to an increased awareness of place and the principles and dimensions that can inform its functioning, perception and ultimate shaping.

Asking Place-related Questions

Place is complex, and that complex overlapping of aspects, issues and opportunities – if an effort to grasp and understand them is sustained – can provide important clues towards its improvement by

design. Carmona et al (2003) for instance identify six interrelated dimensions of our cities as morphological, perceptual, social, visual, functional and temporal layers. Regardless of whether one embraces this specific framework, or a slightly different one, a major mistake here would be thinking that urban digital technology constitutes another, discrete new add-on layer, hence that it can be looked at and designed on its own. High technology however is not a layer the very same way as people and space are not. They are all actants participating in the shaping of place. As Awan et al put it, referring to Giddens's duality of agency, in the case of architecture and buildings, these "are not seen as determinants of society (the primacy of the individual) nor as determined by society (the primacy of structure) but rather as in society. (...) Spatial agents are neither impotent nor all powerful: they are negotiators of existing conditions in order to partially reform them" (Awan et al, 2011; 31). And the interplay of these agents permeates all dimensions. It affects urban form as well as perception and social relationships. It has a bearing on how the city looks like as well as on how it functions, and indeed on how time participates in all these aspects. High technology adds more complexity to them, interplaying with space and people, and participating in a process of constant redefinition of relationships. To understand how, and how to use it within specific urban spaces, we need to 'question' place, and proactively incorporate a deep consideration of context, what its layers mean, and what its agents can afford, within any design formulation. Mattern (2017) highlights this need for a holistic approach well, arguing how "Instead of more gratuitous parametric modeling, we need to think about urban epistemologies that embrace memory and history; that recognize spatial intelligence as sensory and experiential; that consider other species' ways of knowing; that appreciate the wisdom of local crowds and communities"

A possible practical example of this line of thought has been discussed by Aurigi (2013, 138) when noticing that the otherwise advanced system of public and interactive terminals in the Finnish city of Oulu was yet deployed as an 'ubiquitous' solution, or a product that could be 'located' and deployed within urban spaces. As one would expect for a product, questions about usability, information potential, or functionality had been raised – together of course with addressing a plethora of technical issues that included the physical design and maintenance of terminals to withstand the harsh climatic conditions of Northern Finland. Yet questions about the specific civic character and culture of the locations involved had been overlooked. It has been noted how "The terminal/hotspot placed in the market square (...) could really play a significant – and significantly unique – role in a symbiotic relation with the specific place it is part of. As a market square is eminently a space for exchange and transaction (social as well as financial), this character could be boosted digitally by providing place-based opportunities for digital exchange. The possibilities within such an 'augmented market' perspective would still be many and diverse, but they would focus on reinforcing and supporting the place's culture, uniqueness and strengths, rather than providing a 'ubiquitous' service. Context would not just be an opportunity, but it would become one of the central generators of the digital intervention".

Anybody who has ever participated in a design review – be it of an academic or professional nature – for an urban or architectural scheme, knows how crucial a series of place-probing queries are towards facilitating the formulation of an effective brief and set of design intentions. What relationships, spatial, social and economic, exist there and make the place what it is? What meanings does it have to people? What form(s) does it have and how is it likely to be perceived? How is it used, how do people and things move in it, and what happens there? Who lives there or uses it, and why, and what do they think and feel? How does time and environmental conditions affect it? And, more proactively, designers might need to reflect on more complex and choice-embedding questions like: is there anything about the place we need or want to accept or contrast with, through attitudes ranging 'from submission, through symbiosis, to domination' (Unwin 2009, 120)?

What potential as well as conflicts and contestations does the context and its history have? Can such space have a role in a wider urban and/or regional strategy? These questions, and more, are essential to start exploring how a new urban element or system – physical, digital or indeed hybrid – could alter the complexity of relationships already characterising a certain place, and even questioning what – if anything – might be needed at all. Yet, these issues are seldom unpacked before a ‘situated’ digital project is conceived. The “city as a computer” paradigm, as Mattern (2017) calls it, “appeals because it frames the messiness of urban life as programmable and subject to rational order”, and suggests simplifying but distorting urban design practice into the shaping of a hi-tech product. Product design tends to be in itself much less grounded in context and place than urban design. Whilst the interface and interaction with ‘users’ or some of the conceptual and material aspects of this new wave of hi-tech civic design are often thoroughly looked at, to echo Horan’s early concerns, the deep ‘transformational’ and bi-directional interfacing with place is easily overlooked.

CONCLUSIONS: EXTENDING THE PLACE-MAKING DESIGN TOOLBOX

This paper focuses on a gap in research and practice, as the importance and role of physical space and urban design have been looked at only marginally within smart city debates, whilst practice seems to rely on paradigms and visions stemming – unsurprisingly in many ways – from ICT and product design approaches.

A reflection is needed on how on the one hand interrogating and understanding place – and bringing space as a crucial component of it fully back into the picture – could be the first step towards a more sophisticated approach in the design of smart environments. The next, non-trivial challenge however is developing an insight on how the ‘digital’ participates and integrates with the spatial – in a circular relationship rather than a one-way impact trajectory – in making, or re-making place. In other words, once analysis and intentions on how to improve place are clearer and richer, when it comes to actually designing in a hybrid way, how well are we aware of the possibilities (and threats, potentially) of the extended toolbox we are going to use?

Once a rich and place-based brief has been conceived, the issue of updating our design knowledge to reflect the augmented possibilities also arises. On a speculative and intuitive basis it seems clear that issues of spatial relationships and agency, scale, access and mobility, inhabitation, meaning, perception and memory – and more – which we are used to consider carefully when shaping public spaces, are still important, yet often ignored in smart city thinking. On the one hand they should not be jettisoned in the name of an alleged brand new logic of place only depending on the redeeming and innovating power of ICTs. On the other hand they do need to be updated and upgraded to inform design in a re-combined world. It is debatable whether this can be achieved simply through repeated and evolving practice. This upgrading probably needs a thorough research effort. In the 20th Century much intellectual energy had gone into trying to understand articulations, languages and syntaxes of space, and how designers could harness such principles. From Cullen (1961) and Lynch (1960, 1984), to Norberg-Schulz (1971), Alexander et al (1977) or Hillier (1996) – just to name a few – ideas on how space, people and things articulate were usefully framed to help designers make sense of the complexity of places, and be more aware of the potential consequences of their own moves. Some work has been carried out trying to bring high technology and urban design knowledge together, though still with a particular emphasis on designing mainly the digital aspects of place and the social interactions they afford (see for instance Paay et al, 2007). It could be important now to intensify those efforts at the light of the emergence of new variables and extended relationships and possibilities.

Should we therefore augment not just spaces, but our questions on place, and design thinking too? In those questions, and an increased awareness and mastering of a series of extended principles for understanding how hybrid space works, lies the quantum leap between just designing self-contained interactions, which at best are 'located' somewhere, and effectively shaping augmented place, making a significant difference for the way our cities can become smarter.

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